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EXAMINER	
GE, YUZHEN	
ART UNIT	PAPER NUMBER
2624	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/840,089	TIN, SIU-KEI	
	Examiner	Art Unit	
	YUZHEN GE	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 August 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-13,15-24 and 26-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-13,15-24 and 26-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/26/2008 has been entered.

Examiner's Remark

Applicant's amendment, filed on 8/26/2008, has been received and entered into the file. Claims 1-2, 4-13, 15-24 and 26-33 are pending.

The 112 2nd paragraph rejections of claims 1-33 have been overcome in view of applicant's amendments/remarks and are hereby withdrawn. However, after careful consideration of the pending claims, a new ground of 112 rejection is introduced.

Regarding applicant's argument that Lin et al disclose changing all color values to non-negative limits of a device gamut, even if the color values started as non-negative values already, the examiner would like to point out that the claimed invention does the same. The specification of the claim invention does not disclose negative luminance values. The specification merely discloses clipping luminance values to non-negative values. Furthermore, applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Arguments on other claims depend on claim 1 and therefore, arguments on other claims have been considered but are moot in view of the new ground(s) of rejection.

DETAILED ACTION

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-2, 4-13, 15-24 and 26-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 12 and 23 recite “the mapped color value in the device independent color value” in the last limitation of the claims. There is insufficient antecedent basis for "the device independent color value" in the claims. The examiner will interpret it as “the mapped color value in the device -independent color space” for examination purposes.

Claims 2, 13 and 24 recite the limitation "wherein clipping the luminance component". There is insufficient antecedent basis for this limitation in the claim. The examiner will interpret it as “wherein clipping the negative luminance component”.

Claims 2, 13, and 24 recite “set(s) luminance component of the device-independent color value which has negative value and chromaticity components to zero”. It is not clear from whether all chromaticity components are set to zero or just the ones that correspond to zero luminance components. The examiner will interpret the limitation as “set(s) luminance component of the device-independent color value which has negative value and the corresponding chromaticity components to zero” for examination purposes.

Claims 2, 4-5, 13, 15, 16, 24, and 26-27 also recite the limitation "the device-independent color value". There is insufficient antecedent basis for this limitation in the claim. The examiner

will interpret it as "the mapped color value in the device -independent color space" for examination purposes.

4. Claims 1-2, 4-13, 15-24 and 26-33 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 1, 12 and 23 recite "clipping a **negative** luminance component of the mapped color values in the device-independent color space to a non-negative value". The specification has not disclosed or described a **negative** luminance component of the mapped color values in the device-independent color space.

Claims 2, 13, and 24 recite "set(s) luminance component of the device-independent color value which has **negative** value and chromaticity components to zero", which does not seem to be described in the specification.

Claims 4, 15 and 26 recite "wherein the luminance components of the device-independent color value is allowed to take a value higher than **a diffuse white point** of the device-independent color space", which does not seem to be described in the specification.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 5, 11-12, 22-23, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al (US Patent 6,181,445) in view of Hardeberg (US Patent 6,728,401).

Regarding claim 1, Lin et al teach a method of correcting a forward model (col. 7, lines 25-36) of an input color device, comprising;

mapping an input color value (RGB values col. 7, lines 25-36) generated by the input color device into a mapped color value (XYZ value, col. 7, lines 25-36) in a device-independent color space (XYZ color space or CIE L*a*b* space, col. 7, lines 25-27 and lines 65-67) by using the forward model of the color input device (col. 7, lines 19-36, the inverse function convert from device dependent color values to a device-independent color value, col. 8, lines 4-21);

determining whether or not the mapped color value is outside a human visual gamut (Figs. 6A-6B, the gamut 133 is a human visual gamut, see also Fig. 4, device gamuts are inside of a visual spectrum by definition, col. 9, lines 57-65, col. 15, lines 46-61, see also the definition of CIE XYZ color space and the paper by Vrhel et al); and

generating a corrected color value (point 142 for point 141 and point 145 for point 144 in Fig. 6B, col. 11, lines 48-52) in the device independent color space by clipping the mapped color value in the device-independent color value outside the human visual gamut to a boundary of the human visual gamut based on the determination result (Figs. 6A-6B, point 144 is clipped to 145, point 141 to 142, col. 15, lines 46-61).

However they do not explicitly teach clipping a negative luminance component of the mapped color value in the device-independent color space to a non-negative value. In the same field of endeavor, Hardeberg teaches setting the luminance component of the device-independent

color value which has a negative value to a non-negative value (col. 9, lines 26-31). By the definition of luminance, it should be greater than or equal to 0. It may be small than 0 only when mathematical derivation and approximation are used. It is desirable to have the luminance values that correspond to real pixel values and correct any error made during mathematical manipulations and estimations (col. 9, lines 5-31 of Hardeberg). Therefore it would have been obvious to one of ordinary skill in the art, at the time of invention, to clip a negative luminance component of the mapped color value in the device-independent color space from some computations to a non-negative value so that the luminance value is meaningful.

Regarding claim 5, Lin et al and Hardeberg teach the method of claim 1. Lin et al further teach wherein the mapping maps the clipped device-independent color value outside the human visual gamut to an intersection between a line defined by the clipped device-independent color value and a white point and the boundary of the human visual gamut (the point on L* axis is the white point, Fig. 6A, the point 135 is the result of mapping, 134 is the clipped color value outside the gamut).

Regarding claim 11, Lin et al and Hardeberg teach the method of claim 1. Lin et al further teach wherein the device independent color space is CIELAB (Figs. 3B, 5A-8, col. 10, lines 19-49, col. 11, lines 39-53).

Claims 12, 22 and 23, 33 are the corresponding system and computer readable medium claims of claims 1 and 11. Lin et al teach a system (Figs. 1 and 12, col. 5, lines 17-28) and a computer

readable medium (col. 6, lines 21-41, Fig. 12). Thus Lin et al and Hardeberg teach claims 12, 22 and 23, 33 as evidently explained in the above-cited passages.

7. Claims 2, 4, 6-10, 13, 15-21, 24, and 26-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al in view of Hardeberg (US Patent 6,728,401), further in view of Spaulding et al (US Patent 5,539,540).

Regarding claim 2, Lin et al and Hardeberg teach the method of claim 1. However they do not explicitly teach wherein clipping the luminance component sets chromaticity components to zero for the luminance component that has a negative value. When a luminance value is set to 0 which corresponds to black, then the chromaticity components should be set to 0. Spaulding et al further teach when luminance value is 0, the chromaticity components are also 0 (Figs. 3, 6, 20, 22 and 24). It is desirable to have the luminance values and chromaticity components that correspond to real pixel values and correct any error made during mathematical manipulations and estimations (col. 9, lines 1-31 of Hardeberg). Therefore it would have been obvious to one of ordinary skill in the art, at the time of invention, to set chromaticity components that correspond to a negative luminance component to zero so that the chromaticity components are meaningful.

Regarding claim 4, Lin et al, Hardeberg and Spaulding teach the method according to claim 2. Lin et al further teach wherein the luminance component of the device-independent color value is not clipped at an upper bound in the clipping (col. 16, lines 8-31, the white point is specified by

the threshold and the luminance is allowed to exceed the threshold value, Fig. 6B, point 141 to point 142, col. 15, lines 46-61, e.g. luminance levels from 0 to 40 are clipped to 30-40, while those from 40-100 are unchanged) wherein the luminance components of the device-independent color value is allowed to take a value higher than a diffuse white point of the device-independent color space (col. 16, lines 8-23, luminance values are allowed to be higher than 95, which is regarded as the diffuse white point).

Regarding claim 6, Lin et al, Hardeberg and Spaulding teach the method of claim 2. However they do not explicitly teach wherein the boundary is the ISO standard CIE spectral locus on a chromaticity space. The CIE spectral locus is a gamut on a chromaticity space. Therefore the same method taught by Lin et al can be applied because the method of Lin et al does not constrain to any specific gamut. Lin et al also explicitly show the ISO standard CIE spectral locus on a chromaticity space as a gamut or a subspace of a color space (Fig. 4, col. 9, lines 57-65, the chromaticity of the visible spectrum shown by Lin et al is ISO standard CIE spectral locus, also the ISO standard CIE spectral locus is a well known gamut). It is desirable to reproduce color images (col. 1, lines 25-50 of Lin et al) and to broaden applications of the method taught by Lin et al to other gamut and it is desirable to have a system and method for color selection and color modification in the context of a uniform color model. Therefore it would have been obvious to one of ordinary skill in the art, at the time of invention, to apply the method of Lin et al to gamut whose boundary is the ISO standard CIE spectral locus on a chromaticity space to broaden the application of Lin et al and enable color selection and modification in a uniform color model.

Regarding claim 7, Lin et al, Hardeberg and Spaulding teach the method of claim 6. Lin et al further teach wherein the chromaticity space is the CIE chromaticity xy plane (col. 9, lines 57-65, Fig. 4).

Regarding claim 8, Lin et al, Hardeberg and Spaulding teach the method of claim 6. Lin et al teach using a perceptually linear chromaticity space (Figs. 5A, 6A and 7-8). Hardeberg further teaches to use a color space CIELUV (col. 6, lines 34-44) and it is well-known in the art that the coordinates of chromaticity space u'v' can be obtained from CIE LUV color space values. It is also well-known in the art that different perceptually linear chromaticity space such as the CIE uniform chromaticity scale (UCS) u'v' plane can be interchangeably used for other chromaticity space. Using a perceptually linear color space or perceptually linear chromaticity space is advantageous because it is uniform according to human visual system (col. 6, lines 31-39 of Hardeberg). Therefore it would have been obvious to one of ordinary skill in the art, at the time of invention, to use a CIE uniform chromaticity scale (UCS) u'v' plane so that the color space is perceptually uniform according to human visual system.

Regarding claim 9, Lin et al, Hardeberg and Spaulding teach the method of claim 1. Lin et al further teach wherein the device independent color space is CIE XYZ (col. 7, lines 25-36, Figs. 3A and 13A).

Regarding claim 10, Lin et al, Hardeberg and Spaulding teach the method of claim 1. Hardeberg further teaches wherein the device independent color space is CIELUV (col. 6, lines 34-44). Using a perceptually linear color space is advantageous because it is uniform according to human visual system (col. 6, lines 31-39 of Hardeberg). Therefore it would have been obvious to one of ordinary skill in the art, at the time of invention, to use a CIE LUV color space so that the color space is perceptually uniform according to human visual system.

All the limitations of system claims 13 and 15-16 are in the corresponding method of claims 2 and 4-5. All the limitations of computer readable medium claims 24 and 26-30 are in the corresponding method claims of claims 2 and 4-8. Lin et al teach a system (Figs. 1 and 12, col. 5, lines 17-28) and a computer readable medium (col. 6, lines 21-41, Fig. 12). Thus Lin et al, Hardeberg and Spaulding et al teach Claims 13, 15-16, 24 and 26-30 as evidently explained in the above-cited passages.

Claims 17-21 and 31-32 are the corresponding system of claims 6-10 and computer readable medium claims of claims 9-10. Lin et al teach a system (Figs. 1 and 12, col. 5, lines 17-28) and a computer readable medium (col. 6, lines 21-41, Fig. 12). Thus Lin et al, Hardeberg and Spaulding et al teach Claims 17-21 and 31-32 as evidently explained in the above-cited passages.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YUZHEN GE whose telephone number is (571)272-7636. The examiner can normally be reached on 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Yuzhen Ge/
Examiner, Art Unit 2624

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